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THE FORESTER

Vol. VII

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THE PLATFORM OF THE FORESTER

In order that the good will of its readers may become as effective as possible in aiding to solve our present forest problems, the *Forester* indicates five directions in which an effective advance is chiefly needed.

1. The forest work of the United States Government which is now being carried on by the Department of Agriculture, the General Land Office, and the Geological Survey conjointly, should be completely and formally unified. The division of authority between the three offices involves great waste, and consolidation is directly and emphatically pointed to by the present voluntary co-operation between them.

2. A system of forest management under the administration of trained foresters should be introduced into the national and state forest reserves and parks.

3. Laws for the protection of the forests against fire and trespass should be adapted to the needs of each region and supported by the provisions and appropriations necessary for their rigorous enforcement.

4. Taxation of forest lands should be regulated so that it will encourage not forest destruction but conservative forest management.

5. The attention of owners of woodlands should be directed to forestry and to the possibilities of applying better methods of forest management.

Persons asking themselves how they can best serve the cause of forestry will here find lines of work suggested, along which every effort will tell. No opportunity for doing good along these lines should be neglected.

J. A. ALLEN,
Editor.

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AN ADIRONDACK FOREST, COMPOSED OF SHRUBBY HARDWOODS, YOUNG SPRUCE
AND FIR WHICH WERE BLOWN DOWN BEFORE MATURITY, AND A
SCATTERING GROWTH OF OLD WHITE PINES. THE LAND
IS FIT FOR LITTLE BUT PINE. PRIMEVAL FOREST.

(PHOTOGRAPH BY T. H. SHERRARD.)

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THE FORESTRY AGITATION IN NEW HAMPSHIRE.

BY E. M. GRIFFITH.

Division of Forestry.

WITHIN the last few months the people of New Hampshire have suddenly come to realize the extent to which their forests are being stripped by the lumber and pulp mills, and actuated by the fear that their beautiful mountain scenery will be seriously impaired and the water supply of their rivers affected, they are inclined to adopt extreme measures.

The following bill was presented to the Legislature but failed to pass:

"An Act for the Preservation of Forests.

"Be it enacted in the Senate and House of Representatives in general court convened.

"Section 1. From and after the first day of May, 1901, it shall be unlawful for any person within this State to cut or remove any spruce, pine, fir or hemlock tree, unless the same shall be ten inches in diameter two feet above ground, or fallen, burned or blighted timber; provided, however, that the terms of this act shall not apply to any person cutting wood for his own exclusive, domestic consumption, or to any person clearing land for actual agricultural uses, not exceeding twenty-five acres in any one year.

"Section 2. From and after the first day of May, 1901, it shall be unlawful for any railroad or other transportation company to transport or to have in its possession for the purpose of transportation, except

it shall receive the same from some point outside the State, any spruce, pine, fir or hemlock timber in the log, the diameter of which at the larger end shall measure less than ten inches.

"Section 3. For every tree or log cut or removed, transported or had in possession for the purpose of transporting in violation of Sections 1 and 2 of this Act, there shall be forfeited the sum of ten dollars to be recovered by action of the county solicitors on complaint of the forestry commission, and the money accruing from fines thus recovered shall be treated as funds received under the provisions of Section 4, Chapter 44, Laws of 1893."

Such a measure is far too radical, and even if it were possible to secure its passage the law would become a dead letter for the reason that it would be impossible to enforce it. This would be the case from the fact that many small trees below two inches in diameter, valuable for pulpwood, must be cut in making logging roads to reach the large timber. It would be a useless waste to oblige the lumbermen to leave these small logs in the woods to rot, and public opinion would force the State to authorize their being cut and removed. Then, unless the State detailed a policeman to watch the cutting in each camp, it would be almost impossible to prove that certain small logs were cut illegally. There is also great question as to whether such a law is constitutional, and it is cer-

tainly opposed to American customs, which allow every citizen to manage his private property as he sees fit.

Section 1 in the bill limits the cutting of spruce, pine, fir or hemlock to a diameter of ten inches two feet above the ground. Section 2 makes it unlawful for any railroad or other transportation company to have in its possession for the purpose of transportation, except it shall receive the same from some point outside the State, any spruce, pine, fir or hemlock timber in the log, the diameter of which at the large end shall measure less than ten inches.

If it were possible to enforce this law it would mean that every tree must be cut and transported in its full length. For if the tree were cut up into short lengths many of the logs, especially top logs, would measure less than ten inches at the large end, although they might have been cut from trees twelve, fourteen or sixteen inches in diameter two feet above the ground. It would be both absurd and impossible to attempt to enforce Section 2. Then, too, anyone familiar with the timber lands and lumbering operations of New Hampshire should know that it is both undesirable and impossible to adopt the same diameter limit for all sections of the State. No lumberman or trained forester would cut the timber on high slopes in the same way that he would the timber lying in the valleys.

In the valleys and on the lower slopes, where, as a rule, a considerable amount of hardwood is found in mixture with the spruce, it would be a short-sighted policy to remove all the spruce and allow the hardwoods to take complete possession of the soil. Here every forester and most of the up-to-date lumbermen in New Hampshire would strictly limit the diameter to which the spruce should be cut. But on the higher slopes, where the growth is very often pure spruce, limiting the diameter and so thinning out the timber, would almost surely result in the trees which were left being blown down. In such localities every tree of any value must be removed at the first cutting, and in a short time the soil will be covered

with a growth of either spruce, poplar, white birch, maple, or bird cherry.

It is a great pity that the well-meaning friends of forestry are so often impractical, and hence antagonize the lumbermen who are trying to handle their property to the best advantage. But it is extremely fortunate for New Hampshire that such a considerable part of the timberlands are owned by large companies who know the value of the timber, especially the spruce, and would never think of clean-cutting it.

The small owner cannot afford to hold his timber and pay the taxes upon it, and so is forced to clean cut. Then, too, the large companies, especially the much-abused pulp-mills, own very valuable water powers and are vitally interested in seeing to it that the cutting of timber is so managed that the water supply shall not be affected.

This much-discussed point of the effect of timber on water supply is very generally misunderstood. The volume of water which passed down the Androscoggin River during 1900 may have been as great as it was one hundred years ago, in 1800, but in 1900 a very large percentage of the total volume passed down the river during the early spring months, while in 1800 it was more evenly distributed throughout the year.

This comes from the fact that the lands bordering the Androscoggin and its tributaries have been clean cut and in the early spring the deep snows lie exposed to the full force of the sun and melt very rapidly, causing extremely high water for a short time. The dense virgin forests far back from the river are holding the snow and storing up water for the summer months, but this area has been tremendously reduced since 1800.

In the dry summer months the water in the river is so low that the mills are often obliged to buy water from the Power Company at Rangeley Lakes, and so they are coming to see that they must carefully restrict the cutting of timber along their streams. Water power is horse power and no sensible man wants to see it going over his mill-dam in May when he must buy it in July.

The timber and water-supply interest the mill-owner more than any one else, because without them his costly mill is useless, and New Hampshire would be safe in leaving her timberlands in his hands if he were intelligently advised and the State encouraged him to handle them for a constant yield.

In the first place, the State should see to it that the Board of Equalization is composed of men who know the timberlands upon which they fix the taxes, and not a body of city men appointed for political reasons who do not know a spruce from a white birch. Then, all land which is allowed to grow up to forests should be exempt from taxation, and on all timberland where the cutting has been restricted the taxes should be proportionately reduced.

The timberland owner often does not care to restrict his cutting, because the State gives him no protection from fire, and the timber which he leaves standing is liable to be burnt up. The State should oblige all locomotives to carry spark protectors and pass stringent fire laws which would hold a man responsible for all damage from any fire which he set maliciously or otherwise.

New Hampshire derives large sums each summer from the tourists who are

attracted by the wonderful mountain scenery and every effort should be made to preserve the timber at the chief points of interest. But the lumber and paper companies who usually own the timber naturally intend to cut it and cannot be expected to keep roads and trails in repair for the use of summer visitors.

The State may not be rich enough to buy a large forest reserve but it should certainly own the principal mountains, such as Washington, Adams, Jefferson, etc.

So far there have been very few serious fires in these mountains, and little bare or burned over land is to be seen, but with lumbering operations along the higher slopes the danger will be very much greater.

Bonds could be issued to pay for these lands and the sale of the mature timber would more than pay the interest on them. Let the Society for the Protection of New Hampshire Forests, the committee on forestry from the house of representatives, and the men in charge of the timberlands owned by the big lumber and paper mills come together and devise some rational, practical plan for the intelligent management and protection of the vast and enormously valuable forests of the State.

THE FOREST LAWS OF NEW YORK.

BY TREADWELL CLEVELAND, JR.

THE English settlers of the Colony of New York brought with them an inherited respect for the value of trees, and among the earliest regulations are to be found provisions against their wasteful use and for their protection from fire. But earlier still, during the Dutch occupation of New Amsterdam, it appears that safeguards existed for the care of forests. Thus in 1650 the Director and Council of New Netherlands, acting for the West India Company, granted to "freemen the liberty to cut and draw from the public forests as much firewood and tim-

ber as they should require." Public forests must therefore have been respected, since the use of timber growing therein was regarded as a privilege rather than a right.

Among the "Duke's Laws," in force from 1665 to 1675, is a provision by which all persons are forbidden to "kindle any fire in the woods or grounds lying Common, or in his own Grounds so as the same shall run into any Corne Grounds or Enclosures of his neighbors; the penalty being the full amount of damage and half as much again for a fine, or in case of inability to pay, corporal punishment not ex-

ceeding twenty stripes or service to 'Expiate the Crime.'"

When, in 1697, the Earl of Bellomont became Governor of New York, he was at once aware of the value of the timber lands. The letters which Bellomont wrote home to his superiors, especially those to the Lords of Trade, who heard all his reports and recommendations and advised him in detail, make frequent and urgent appeals for more provident regulations concerning the use of timber.

He saw in the pine forests plentiful supplies of ships' timbers and of naval stores—turpentine, pitch, tar, rosin—and these he was zealous to preserve for the Royal Navy. Thus in a letter of May 29, 1699, he writes of 20 masts which a certain Mr. Delliuss had cut on his largest grant and which had been floated down the Hudson. "I am told there are most larger on that land," he says, "and an infinite number of them, and 'tis said too, the timber is much firmer than at Pescataqua and more solid." On April 8, 1676, the Council had passed an order providing "that for the future no trees be cut for planks, or other use for sale, but from the latter end of November to the beginning of March, and the tree not to be less than twenty inches through; and the Court of Assizes had granted two petitions of a Mr. Hallet, the first in 1669, "about Barking of Trees," and the second in 1671, to prevent "ye destroying of his timber by Tanners and Strangers."

Bellomont desired to carry through very rigorous measures. Writing again to the Lords of Trade under the date of August 24, 1609, he speaks of "a necessity of giving the King sole rights of all the woods in the Province, reserving to the inhabitants the liberty only of house-boot, fire-boot, hedge-boot, and plough-boot, that is, a sufficient supply for the construction and repair of their houses, for fuel, etc. He speaks also of what he terms a "barbarous custom": "In the dry times of the year the people burn the woods to clear the land, and often where a man has a design to clear but ten acres, the fire shall consume twenty times as much, for the Pine and Fir (which will be chiefly useful as Naval

Stores) burn like torch wood, and if the body of the tree escape from being burnt down, yet the bark never, and so the Tree dies."

Once while on a visit to Boston, Lord Bellomont wrote that the Lieutenant Governor of New York had issued a proclamation forbidding the cutting of any of those great trees fit for masts," adding: "But in the Province of New York, people little mind Proclamations or Laws either." In 1700 Bellomont urged the passage of an act "obliging every body who cuts down a tree to plant four or five young trees in its stead, which, I am told, is the custom in Norway, otherwise the woods in Norway would have been exhausted long ago." During the following decade the waste of woods was so seriously felt that an act was suggested imposing a fine of 100 pounds for every tree cut or destroyed, except by the government's permission."

Bellomont's predecessor, Gov. Fletcher, had made enormous grants of land. These Bellomont regarded as most extravagant, and he used his influence to have some of them vacated, not without success.

In 1710 an act was passed (Nov. 25th) to prevent the burning of woods, which fixed a penalty of forty shillings for its offenders. A later fire law in 1743 (Dec. 17th) provided that if one person burned the woods of another, he must pay 5 pounds for each offense, and damages, or else be imprisoned 3 months, or till he could find bail. It provided further that any one discovering a fire should call to his aid all persons within reach to help him extinguish it, and a fine of five shillings was imposed on all who refused to help, except for good reasons. This act expired three years later, in 1746. A similar act was passed in 1758 and in 1760 came a fuller law, which, in turn, expired in 1766, and was succeeded in the same year by a detailed law, December 19, 1766, entitled "An act for Extinguishing Fires in the Woods in the Counties of Albany, Webster and Orange." This law provided for the election of "firemen," or as we should say "fire-wardens," who were authorized, on seeing or hearing of

a fire within their respective districts, or adjacent thereto, threatening damage to inhabitants, to require every able-bodied man residing within the district to assist them in extinguishing it with all care and possible diligence. For refusing to obey the fireman's call the fine was three shillings, and for every neglect of duty the fireman was to forfeit two pounds. Further acts for the preservation of the woods from fire followed in 1785, and later.

These different acts stood in need of revision and unification, and accordingly in 1788 there was passed a general act which fixed the penalty for firing the woods at ten pounds with costs of suit. The law was amended in 1817.

In 1791 had been founded the New York Society for the Promotion of Agriculture, Arts and Manufactures. The very first year of its existence this Society secured the passage of an act which was the first law for the encouragement of timber culture ever passed in this country. It provided for a bounty of six shillings for every fifty white mulberry trees planted under certain conditions, till the whole number reached two hundred. In 1795 a committee of this Society also made an interesting report on the "best mode of preserving and increasing the growth of wood and valuable timbers."

Several further negotiations regarding trespass and the use of fire in or near woodlands were enacted in succeeding years.

A period of small interest to the forest follows, which comes to an end with the enactment in 1869 of a tree planting law which provides an abatement of tax for land owners planting trees along highways—\$1.00 for every four trees set out opposite their lands.

But the first very important promise of better things to come, was the creation in 1872 of the so-called Commission of State Parks, who were to hold office two years, and whose duty it was "to inquire into the expediency of providing for vesting in the State the title to the timbered region lying within the counties of Lewis, Essex, Clinton, Franklin, Saint Law-

rence, Herkimer and Hamilton, and converting the same into a public park."

From the report made by this Commission, May 15, 1873, some striking facts were brought to light. The Commission had found that only 40,000 acres in the region specified then belonged to the State, and that the owners of the remaining lands showed an evident readiness to combine for the purpose of raising prices, should the State feel inclined to buy. It therefore recommended that the State should withhold from sale its possessions in this region, and that it should retain all lands forfeited to it for non-payment of taxes.

No action followed. It was not till ten years later, 1883, that a law was passed prohibiting further sales of land in the counties named in the above act, and also in the counties of Saratoga and Warren. During the interval the sale of State lands had been continued; but by the time of the passage of the law 600,000 acres had reverted to the State for the non-payment of taxes; and these were retained subject to cancellation and redemption.

The Legislature of 1884 appropriated the sum of \$5,000 to be used by the Comptroller in the employment of such experts as he might deem necessary to investigate and report upon a system of forest preservation. Thus were appointed the members of the so-called "Expert Commission," with Professor C. S. Sargent at their head. Their report urged that the State try the management of the lands which it then held rather than launch forth into purchase before making sure of its ability to do efficient work on a small scale. They submitted bills to the Legislature which were as nearly perfect as conditions permitted, but which were strongly opposed by the timbering interests. As a result a compromise bill was introduced and enacted. Much that had been of value in the original bill was struck out, but this act, which became law May 15, 1885, still represented the most comprehensive forest law passed up to that time by any of the States. New York thus a second time took the lead.

It is quite unnecessary to rehearse here

the general scope of the act of 1885. Troubles followed; bills were passed enabling the Commission to buy and exchange lands, and to sell both lands and timber. But the land negotiations were not profitable to the State and the method of exchange was abolished.

A spirit hostile to the purposes for which the Forest Commission was established arose in districts where the exemption of State lands from taxes worked an injustice. To remedy this an act was passed in 1886 which provided that all wild or forest lands required by the State within the limits of the Forest Preserve should be taxed at a like valuation and at a like rate as those at which similar land within the same counties were assessed and taxed. In 1887 (Ch. 562) there was passed an act to establish parks for the propagation of deer and other game upon lands belonging to the State in the Catskills. The parks were selected and the deer caught and confined. But the deer did not thrive within the narrow limits provided, and they were again released.

Arbor Day was established by the act of April 30, 1888. Since then the Friday following the first day of May has been celebrated as Arbor Day. In accordance with authority conferred by this law, the Secretary of Public Instruction has published numerous excellent pamphlets and a comprehensive Arbor Day Manual.

By an amendment to the Revised Statutes passed May 7, 1889, the penalty of a twenty-five dollar fine was imposed for every tree cut or carried away by any person, from State lands, Indian lands, or lands within the Forest Preserve.

The project to establish a State Park in the Adirondack region was again vigorously pushed about 1890 under the leadership of the Adirondack Park Association, and in 1892, came the act to establish an Adirondack Park and to authorize the purchase and sale of lands within the counties included in the Forest Preserve.

The Forest Commission was reorganized in 1893, the plan being to hand over the control of the Preserve to the State Agricultural Department after five years. But in 1895 this arrangement was prevented

by the consolidation into a single Commission of the Old Forest Commission with the Fish and Game Commission, the name being changed to the Fisheries, Game and Forest Commission.

A year before had come the Constitutional Amendment (Sec. 7, Art. VII.) which provided that the timber on the Forest Preserve could not be cut, or destroyed. This amendment was not the natural growth of an intelligent policy of protection; for that would have provided for a prudent exploitation of the forest. It was a necessary act of self-defence, to which the citizens of the State were driven by the uncertain and unsuccessful methods of the Commissioners. No sooner was the amendment adopted than plans were set afoot in the Legislature for its repeal. At the end of the two years required, before a proposed amendment could be laid before the people, viz., in 1896, a proposal to repeal the amendment of 1894 was put to vote on Election Day. The President of the Commission, in a letter published in the *New York Times*, asked the people to vote for the new amendment; and oddly enough the only recommendation he had to urge was the statement that neither the new Commission nor its predecessor had anything to do with the proposal. On election day the people showed their faith in this recommendation by rejecting it by the largest majority ever polled against a constitutional amendment—a majority of 350,000.

The terms of the first appointees of the Fisheries and Forest Commission came to an end in March, when Governor Roosevelt appointed the five present* officers for terms of five years.

By an act of February 19, 1900, the name of the Fisheries, Game and Forest Commission was changed to the Forest, Fish and Game Commission. The alteration is, however, more than nominal. Important amendments to the earlier law appear, and the law also gains in force by its greater clearness and brevity.

During the past session of the State Legislature there was passed another im-

* This paper was written before this spring's reorganization of the Commission.—ED.

portant law amending the above. This created the much-needed office of chief fire-warden. The examples of Minnesota and Wisconsin have plainly pointed to the necessity of a central administrative office charged with the supervision of the work of local fire-wardens. By the same amendment the Commission is authorized to appoint expert foresters, not exceeding three in number, who shall act as deputy fire-wardens, attend to the matter of reforesting burned or barren lands in the Forest Preserve, and otherwise work for its improvement.

Through a most happy arrangement, coöperation between the present Commission and the Division of Forestry, United States Department of Agriculture, has come about. By an act passed April 31, 1900, the sum of \$2,000 was appropriated for the Superintendent of Forests, for the payment of the expenses of experts furnished by the Division of Forestry for estimating standing timber and procuring other information regarding the lands and trees in the Forest Preserve. The three State foresters, appointed under the civil service, were detailed to assist the representatives of the Division of Forestry, their expenses being paid by the State of New York from the appropriation for the chief fire-warden.

The field party from the Division of Forestry, assisted by the State foresters, began work early in the summer on one of the well-timbered townships in the

Adirondack Preserve. The field work was continued until October and will result in a detailed working plan for the tract examined, which will be published both by the Division of Forestry and the Forest, Fish and Game Commission.

No accurate knowledge of the stand of trees either in single districts nor in the Adirondack Preserve, as a whole, has been available till now. Naturally all intelligent management will wait upon the gathering of this knowledge. This working plan, the first ever made for any part of the State Preserve, will be submitted to the Legislature with recommendations urging the passage of an act looking toward the repeal of Art. 7, Sec. VII. of the State Constitution, which now stands in the way of all forest utilization. In view of the scientific character of this work, of the very successful operation of the Division's working plans among private owners in the Adirondacks, and of the changed and now thoroughly intelligent sentiment of the people of the State, the prospect of the fulfilment of this plan is most promising. If success is attained, New York will for a third time take the lead in practical forestry among her sister States. But more than this, the work which has just been indicated marks a very important date in the history of forestry in this country. State and Federal coöperation in practical forest management has been for the first time realized.

IMPROVEMENT FELLING AS A FINANCIAL SUCCESS.

BY F. E. OLMSTED.

Division of Forestry.

ALL forest crops consist of material differing in value; there is invariably a chief product which commands high and steady prices in the market and also inferior products for which there is no sale, or at least a very uncertain market. It often becomes necessary for the good of the forest to remove a large

part of this inferior material; in any forest the result to be worked for is of course gradually to increase the stand of the most valuable species, and to do this at the expense of the less valuable. Just here is one of the most difficult problems a forester is called upon to solve.

It is a simple matter of course to take

out the less valuable trees, but to do this with financial success, or at least without a loss, is quite another matter; the success of the undertaking must depend very largely upon the economic conditions surrounding the forest, and in many instances improvement fellings with any hope of profit are entirely out of the question.

Take for example a mixed forest of pine and hardwoods in the South; there is no doubt at all that the future of such a forest would be greatly improved by the removal

far outweigh the amount obtained from the sale of such produce.

A modified form of this question presents itself in the Adirondacks where spruce is the valuable species, and the hardwoods inferior species; here it is merely a comparative matter as in many cases the hardwoods can be harvested at a profit; nevertheless the returns obtained from them are very small in comparison with those which the spruce affords, and very often the lumbering of such trees is carried on



A BADLY FORMED MIXED FOREST OF SAL AND INFERIOR SPECIES, BEFORE IMPROVEMENT FELLINGS.

of a large part of the hardwoods, which would have as a result an increase in the proportion of pine in the reproduction; as pine is the valuable species here and the hardwoods are practically worthless, such a result is of course much to be desired.

In Germany the hardwoods could be cut and sold as firewood at considerable profit, but in this country the expense of lumbering and transport to market would

at a financial loss. It should be the object of management in such a forest gradually to increase the stand of spruce and to do this at the expense of the hardwoods; such an attempt is now being made by Prof. Fernow on the timber lands of the New York State University.

As an example of what may be done under favorable conditions the following brief description of the way in which the

Sal forests of the Dehra Doon Conservancy (British India) are managed may prove of interest.

These forests are exceedingly irregular in the character of their stock, owing to the fact that for many years in the past they have been exposed to constant depredations, reckless fellings, and severe forest fires; as a consequence the Sal (*Shorea robusta*) which is here the most valuable broad leaf timber species, has suffered to a very great extent and the forest now

The principal need is to remove or destroy the trees which interfere with the growth of the Sal and to take out the dead, dying, and unsound timber. Such work is now being undertaken and will extend over a period of fifteen years. Except over limited areas where Sal still predominates, or where Bamboo and Sissu are found (both valuable species, the latter a broad leaf tree valuable for timber) this work can be carried on profitably only on a belt some eight miles in width near the



A WELL STOCKED SAL FOREST; THE RESULT TO BE OBTAINED BY IMPROVEMENT FELLINGS.

consists of a comparatively few well-formed mature Sal trees surrounded by a badly-formed growth of inferior species, and overgrown by a vigorous growth of Sal saplings and poles.

In this case the problem is that of making the forest financially profitable from the sale of inferior material until the young Sal has a chance to develop to maturity.

River Ganges, where a good market for firewood exists.

In lumbering the forest the following rules are observed:

All Sal and Sain (*Termanalia Termentosa*, a tree second in value to the Sal) over two feet in diameter are removed.

Sal and Sain down to six inches in diameter which have ceased to grow, or

are unsound, or interfering with more favorable growth, are also taken out.

All trees and shrubs doing, or about to do harm to the more valuable species are cut; if there is no market for such produce they are killed by girdling.

Badly grown or unpromising saplings of Sal and Sain, where the remainder of the more valuable species is insufficient to form a complete crop, are cut back flush with the ground in order that their shoots may form a vigorous regrowth.

Crowded groups are thinned out.

Two years before the fellings are made the "climbers" are cut away—in this forest and throughout a large part of India these "climbers" (chiefly the "Majan") are very numerous and troublesome, hindering not only the growth of the valuable species but interfering very materially with the fellings.

On the year preceding the fellings the trees to be felled are marked. As a rule the trees to be cut are sold at auction for a lump sum on the stump, and the contractor carries on the lumbering under the direct supervision of a forest ranger who is responsible to the District officer for any damage or mistake which occurs; the

contractor is also liable to fines if the rules are in any way disregarded, and his contract usually keeps him employed for a period of two or three years.

The income derived from such a forest management may be illustrated by the following figures; in recent years the surplus has fallen off to some extent:

1888-89.	
Revenue	\$32,318.00
Expenditure	17,034.00
Surplus	\$15,284.00

1889-90.	
Revenue	\$35,079.00
Expenditure	15,268.00
Surplus	\$19,811.00

On account of a certain small amount of Sal and Sain, and also because of the presence of Bamboo and Sissu over limited areas, this result cannot of course be attributed solely to the removal of inferior species; in the main, however, the operations are decidedly "improvement fellings," and are described simply to show with what success the forest is being gradually made more valuable under a most excellent and conservative management.

THE FOREST AND WATER RESOURCES OF WASHINGTON.*

By HON. ADDISON G. FOSTER.

U. S. Senator from Washington.

WOOD and water, forestry and irrigation, involve great problems.

In solving them millions of people, millions of dollars invested or paid to labor are to be considered. By judiciously protecting our forests, and by applying public appropriation and private investments carefully, there may result a system of irrigating plans which will make productive great bodies of land which still remain parched, desert spots on the face of our country. In this work the West is bound to play the greatest

rôle, and the twentieth century will not only witness the working out of plans now contemplated for forest preservation and for watering irrigable tracts, but will see the fruits of these great efforts adding to our commerce and wealth, and furnishing to foreign markets the manifold products of prosperous and happy millions. This is true for the whole country, but it has a special force for the region of Washington, where the opportunities for taking advantage of the supply of timber and of the possibilities for irrigation are so great. For in the beautiful Evergreen State, in the northwestern corner of our country,

* Abstract of an Address to the National Irrigation Congress met in Chicago Nov. 22, 1900.

there are combined the rich coal regions of Pennsylvania, the iron features of several great States, the fishing industries of the North Atlantic coast, the precious mineral resources of the Rocky Mountain district, and lumber resources that cannot justly be compared with any other section in the world. Further, Puget Sound is the direct approach to the "Open Door" of the Orient. In such a State we need good roads; we need forest protection; we need irrigation facilities.

Forest preservation is a high road to irrigation; forest destruction means floods. No one questions the wisdom of the policy under which the general government controls the commercial waterways of the United States. The construction of storage reservoirs, which will prevent floods, and incidentally serve the purpose for irrigation, is simply an extension of the river and harbor work. Indeed, it is difficult, because of the inter-state questions involved, to see how this work can be done with satisfactory results other than by the general government. A case in point which illustrates this difficulty was the Columbia River flood of 1894. The damage done by this freshet ran into the millions. The entire business portion of the city of Portland was flooded, the river and harbor work at several points was seriously damaged, and there was general devastation for hundreds of miles along the lower river. Now the Columbia River heads in Montana and flows through British Columbia and the States of Washington and Oregon. Its principal branch, the Snake, heads in Wyoming and flows through Idaho, Oregon and Washington, and so on with other tributaries. It is evident that to prevent floods, forest reservation and the reservoir system must be conducted on a far-reaching scale, and must be largely in charge of the general government—just as is other work for the protection and utilization of the nation's waterways.

It is worth considering, however, whether the land which receives the benefit of the stored water should not pay a share of the cost of maintenance, which would be but a small amount per acre per year.

Assuming that the general Government will construct the necessary storage reservoirs, then naturally the next question is, who will construct the canals? The problem may be solved by the unconditional transfer to each State of the irrigable lands within its borders or otherwise; but in any event the subject should be widely and fully discussed. And here again Washington is especially concerned.

To-day the most inviting tracts of our country for thrifty home-seekers are in the Pacific northwest. The available tracts of land in California and the Middle West have been to a great extent taken up, and the home-seekers of to-day, in large numbers, are turning toward Washington and the neighboring States. We have in the State of Washington, as nearly as can be estimated, 117,000,000,000 feet of standing timber, and, approximately, 5,000,000 acres of irrigable lands. The great fir forests are located west of the Cascade range, and the tracts suitable for irrigation are in the eastern part of the State, on the eastern side of this range. The standing timber may be divided, as to quality, as follows:

Red fir,	68,338,421,000 ft.
Cedar,	16,309,453,000 "
Hemlock,	14,848,259,000 "
Pine,	6,586,520,000 "
Spruce,	6,419,215,000 "
Larch,	2,078,601,000 "
White fir,	24,550,000 "
Oak,	3,700,000 "

The irrigable area can reasonably be classified as follows:

Under constructed canals and in cultivation,	150,000 acres.
Under constructed canals but not in cultivation,	50,000 "
Under canals surveyed, but not constructed, and the feasibility of which at reasonable cost has been determined,	1,080,000 "
Under canals projected, the feasibility of which at reasonable cost are undetermined,	510,000 "
Balance presumed to be above possibility of irrigation at cost justified by present conditions,	3,210,000 "
Total,	5,000,000 "

The Cascade and other mountain ranges which encircle the arid district basin will

afford, if properly conserved, an adequate supply of water for every acre that it is possible to reach, and the supply of wood necessary to the settlement of any region is not far to seek.

The problems confronting us, nevertheless, are the same as those in other States. The canals that could be constructed at low cost, and for which the normal flow of the streams furnishes an adequate supply have been built. The additional canals will be larger and, as a rule, more expensive, and before there can be any extensive addition to our present canal system, provision must be made for the conservation of the water supply by storage reservoirs and forest protection. It is, of course, well known that irrigation canal enterprises have been generally failures from the standpoint of the investor, and while it is doubtless true that the failures were to a large extent caused by inexperience and bad judgment, still for the larger enterprises yet to be undertaken with the additional expense of water storage it will be difficult to overcome the proverbial timidity of capital.

As the Far West becomes more densely populated, however, it is probable that sources of revenue may be realized for irrigation purposes not now at our command. For instance, a just plan for deriving a compensation from stock and cattle owners may follow in some States if we extend the forest preservation idea to public grazing lands. At present public grazing lands are being injured by overgrazing, and, in many instances, the cattlemen of small means are deprived of reasonable protection from encroachments by cattle corporations. The Agricultural Department has made numerous extensive investigations on this subject and favors protection for our natural pasturage lands and a just compensation to the government for their use. It seems but reasonable that some system of deriving profit from grazing land rentals might be devised for the purpose of further developing the arid regions of this country, without in any way hampering settlers or others desiring lawfully to acquire lands for agricultural, irrigation or other purposes. In a short time the ex-

penditure of, say fifty per cent. of the rentals of grazing tracts for purposes of irrigation would effect a remarkable change for the better in several of our western States. Exact data for determining the quantity of land that could be leased are not at hand; but assuming that there are forty million acres, which seems a conservative estimate, the gross rental on the basis of five cents per acre would be two million dollars. Of this one-half would be available for irrigation work. Assuming the average cost per acre of placing water upon the land to be twelve and one-half dollars, the million acres would reclaim eighty thousand acres a year. When we consider that this result can be obtained by the simple expedient of making the stockmen and interested corporations pay for something for which many of them are willing and able to pay, and further that they get full value for their money, it seems as if the plan is entitled to the consideration of those interested in irrigation problems.

Practical forestry is needed to make permanent the supply of wood and water which these reserves, not only in Washington, but in other parts of the West, are capable of furnishing to the regions about them. The interests at stake demand as thoroughly and carefully considered management as is applied to any national forest lands in the world. The study of the fire question, both with reference to the means of preventing fires in the future, and in dealing with burned-over lands, is of the first importance upon the reserves. Scarcely less necessary to the development of the highest capacity of the forest for the production of timber is the thorough study of the rate of growth and characteristics of the western timber trees. Should practical forestry be applied to the reserves, which is inevitable, the studies which are now being made by the Division of Forestry of Western Hemlock, Red Fir, and Western Yellow Pine, and other important trees will be of great use; and they already have practical value for private owners of timber lands. The study of Western Hemlock has been undertaken in the belief that in the near fu-

ture the tree will become of great value; for the prejudice against western hemlock is largely due to the idea that it is of the same quality as the hemlock of the East, to which it is really far superior. Any study which may thus result in further development of the timber supplies of the Pacific Coast is of direct value to the irrigators who are dependent on that region for building material and shingles.

With the exception of the woods of California, the forests of Washington are the densest, heaviest and most continuous in the United States; and yet the original growth is fast being cut and burned. Mr. Henry Gannett in his report on the Forests of the United States estimates that there are in western Washington 9,039 square miles covered with merchantable timber. An area of 3,205 square miles has already been logged; a greater area—3,614 square miles of merchantable timber—has been burned. Upon the area already logged it is estimated that 36,000,000,000 feet B. M. have been cut. In other words, out of an area of 15,858 square miles formerly covered with merchantable timber, in the State of Washington, 22½ per cent. has been destroyed by fire, 20 per cent. has been cut, and the remainder, 57½ per cent. is still covered with standing timber. In less than a generation more than two-fifths of the timber

has disappeared, in what is considered the richest merchantable timber region in the world. In the twenty years between 1870 and 1890, the capital invested in this State has increased from \$1,285,000 to \$19,445,000 and the value of the annual production from \$1,307,000 to \$15,068,000.

For the first four months of the present year the increase in shipments by sea of Red Fir was 18 per cent. over the previous year, while the shipments by rail advanced 90 per cent. for a corresponding period. The increased sale in shingles showed a corresponding gain, being 23 per cent. One box factory, at Tacoma, received in a single order a requisition for 16,000,000 grape baskets, requiring over 500,000 feet of spruce. Butter dishes and berry boxes manufactured from Washington woods are ordered in half-million lots, and one factory turns out a quarter of a million of the latter daily.

The timber resources of Oregon and northern California are rich, the demands on them are also great and increasing. The better the economic conditions in Washington and these States are understood, the more clear does it become that the development and prosperity of the Northwest is inseparably connected with the successful completion of irrigation projects, and the economical management of the forests.



Courtesy of the Canadian Forestry Association
SCENE ON THE LAKE LOUISE FOREST PARK RESERVE, B. C. THIS RESERVE IS SITUATED IN THE ROCKY MOUNTAINS,
SOUTHEAST OF LAGGAN, A STATION ON THE CANADIAN PACIFIC NEAR THE LINE BETWEEN
ALBERTA AND BRITISH COLUMBIA.

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Vol. VII.

APRIL, 1901.

No. 4.

Steps toward Consolidating Forest Work.

The irrational and wasteful division of the government's forest work, between the Division of

Forestry of the Agricultural Department, the Land Office and the Geological Survey, which has struck every one who has known anything about the forest situation in this country as being the point at which it has most needed remodelling, is at last being done away with. It would be difficult to say too much in welcome of any reform in this quarter, but many of the FORESTER's readers already know this well. What has actually taken place can best be understood if certain passages in the official correspondence are allowed to explain themselves. In a letter addressed to Mr. M. A. Moody, Congressman from Oregon, Mr. Gifford Pinchot explained his position with regard to the government's forest work as follows:

"In reply to your letter of inquiry of January 18th, I have to say that the forest work of the United States Government is at present divided among three unrelated and independent organizations. These are: The General Land Office, which administers the national forest reserves; the U. S. Geological Survey, which

maps them, describes the irforests, recommends changes in their boundaries, and establishes the permanent boundaries on the ground; and the Division of Forestry of the Department of Agriculture, which is charged with all matters of professional forestry. The chief interests of the latter at present are the promotion of practical forestry among private owners, and the preparation of working plans for conservative lumbering and reports upon technical forest subjects in the national forest reserves at the request of the Secretary of the Interior. The work of the Geological Survey is temporary in its nature and will naturally terminate when the forest reserves have been covered. It is better and more economically done by the Survey than it could be under any other management.

"In the language of the resolution adopted by the National Board of Trade at its meeting held in Washington in December, 1898, 'The liberality of Congress in providing for forest investigations, surveys, and administration has been attended with waste of money and lack of effectiveness, due to absence of concentration of forces in plans for the execution of forestry laws.'

"All the trained foresters in the employment of the United States, and with five or six exceptions all those in this country, are in the Department of Agriculture. The administration of the forest reserves is carried on without the participation of a single member of the trained forest force paid by the Government. A similar situation would be created if a bridge building concern should maintain a corps of highly educated engineers, should separate them entirely from its practical work, and should entrust the building of its bridges entirely to men without practicable or theoretical training for that purpose.

"The proposed administration of the forest work of the Government by the Department of Agriculture is supported by the following reasons:

"1. The Department of Agriculture has already a very important field of forest work for farmers and others—the introduction of practical forestry on private

forest lands—which cannot be moved elsewhere. The interests of private forest owners, which can be looked after only by this department, are immensely greater in area than those of the Government in the forest reserves. The amount of forest in farms alone is more than four times greater than the whole area of the reserves.

"2. The time for the introduction of practical forestry on many of the forest reserves has fully come. This is shown by the fact that private owners have sent applications to the Department of Agriculture in the last two and a half years, for assistance to that end on about three million acres of their land. Since every trained forester in the Government service is in the Department of Agriculture, that Department is evidently the only agency that can introduce practical forestry on the forest reserves. The request of the Secretary of the Interior to the Secretary of Agriculture for reports upon technical forest matters is unanswerable evidence on this point.

"3. Every source of wealth grown from the soil is already in the sphere of the Department of Agriculture. Hence the forest work rightly belongs to it. The Department of Agriculture is already familiar with the problems and conditions of the forest reserves.

"It is evident that whatever relates to titles, patents, and ownership of the land in the forest reserves should remain in the control of the General Land Office; and it has been objected that a separation of this branch of the work from the practical administration of the reserves is not feasible. To my mind the dividing line is a perfectly clear and sharp one. As a private individual pays a lawyer to advise him and determine, with the aid of the courts the ownership of his real estate, and entrusts the care of it to another agent, so may the United States. The determination of the ownership should be left to that branch of the Government best adapted to the work. The administration of the forests should likewise, without question, be in the hands of the men who are specially trained for that purpose."

Before this letter was written the Secretary of Agriculture and the Secretary of the Interior had been considering the possibility of having the national forest reserves put under the charge of the foresters of the Agricultural Department. There was some chance that the matter might be referred to Congress, and the Chairman of the House Committee on Agriculture asked the Secretary of the Interior for his opinion on the matter. In reply Secretary Hitchcock wrote on January 9th:

"I am in receipt of your letter of January 5th, in which you ask, in behalf of the Committee of Agriculture, for my views on transferring the administration of the forest reserves, now under the control of this Department, to the Department of Agriculture. I have considered the matter fully, and I am of the opinion that, although there can be no question as to the desirability of a complete consolidation of the Government's forest work, it would probably be unwise to attempt to secure adequate legislation during the present short session of Congress. On the other hand, it is eminently necessary that the trained foresters of the Government should have charge of all the technical government forest work. In order to bring this about, the following plan has been agreed upon by the Secretary of Agriculture and myself, subject to the action of your Committee.

"The police and patrol of the forest reserves will remain under this department, together with the routine office work necessary thereto. The investigation and decision of all technical forest questions and the execution of the resulting plans will be in the charge of the Forester and his chief assistants, whom I will appoint as special agents without pay, directly responsible to myself. The officials and employees of the Department of the Interior will furnish promptly and cheerfully, in the office and in the field, all assistance, information, maps and documents necessary for the execution of this work, and will cooperate with the Forester and his assistants in every way. Reports on forest work and conditions and

related subjects in the reserves, prepared by the Forester and his assistants, will be made directly to me.

"This plan will secure the execution of work indispensable to the use and preservation of these forests, for the lack of which they are now suffering. While it will entail additional work upon the Department of Agriculture, it will involve no duplication of function. It is, in my judgment, by far the best solution of the problem which can be reached this year."

The Secretary of the Interior thus did not advise any attempt to settle the matter by legislation during the last session, but outlined a plan, to which he and the Secretary of Agriculture agreed, for putting the management of the forest reserves under the immediate supervision of the Forester of the Department of Agriculture. Congress, accordingly, did not act in the matter. Secretary Hitchcock has not yet taken any formal steps toward the transfer of work upon the reserves from the Land Office to the Division of Forestry, but there is no reason to doubt that such steps will soon be taken.

Briefly, the forest reserves which have hitherto been under a management which was completely removed from all connection with a corps of Government officers who had been especially trained for just such work, are at last being brought under the supervision of these officers. This state of things was unreasonable and costly, and could result only in harm to the reserves. Although it has not yet been formally corrected by a vote of Congress, it is safe to say that it has, for the time being, been set right by mutual consent of the Secretary of Agriculture and the Secretary of the Interior. It is not too much to say that no such stride toward the proper management of our forests and public forest lands has been made since the act which authorized the establishment of national reserves was passed in 1891.

Big Basin Park to be Established.

The campaign to preserve the redwoods of the Big Basin in the Santa Cruz mountains of California, which the Sempervirens Club has

been so ardently pushing, was last month successful. By a vote of 55 to 1 in the house, and 30 to 2 in the senate, the State legislature appropriated \$250,000 for the purchase and maintenance of the tract, and five commissioners were appointed by the governor to disburse the money. In this act California has not only done a great service to the cause of forest protection in the United States, but has also given her citizens a superb park for the enjoyment of themselves and their posterity. The Big Basin redwoods possess every qualification of an excellent pleasure ground. Situated within a few hours' ride of San Francisco and other large towns, they nevertheless retain all the character of a wilderness—large areas of primeval woodland, with every aspect of stream and hillside. Besides this the trees themselves are already famed for their size and development, which in any substantial bodies of timber, are unsurpassed short of the heavy stands in the northern countries of the Coast. Park and woodland are here unusually combined, and the State may well be proud of the energy and public spirit which has secured their perpetuation.

The Society of American Foresters.

The Society of American Foresters, which was founded in Washington by a number of members of the Division of Forestry early in the winter, has been in existence long enough to give good promise of filling the very distinct field of usefulness which is awaiting it. Its objects as expressed in its constitution are: "To further the cause of forestry in America by fostering a spirit of comradeship among American foresters; by creating opportunities for a free interchange of views upon technical and allied forest subjects; and by the dissemination of a knowledge of the purpose and achievements of practical forestry." Thus far in this country forestry has been taken up and advocated by one man here and another man there, each of whom has had to work out the questions which interested him almost wholly alone, who have

seldom any of them been able to test their practical suggestions and conclusions by practice, and who have often not even had the advantage of being able to exchange ideas with people who were interested in the same subjects. To a certain degree, this worked well: the result has been that the spirit in which American forest questions have been approached by the serious of purpose has been eminently practical. But, on the other hand, this state of things has been faulty in ways which have grown more and more apparent. There has been an almost total lack of professional feeling and of all which that means. The confusion in the forester's technical dialect, which was referred to in the February FORESTER, is a good example of the result of this, and is the sort of thing which

a society containing the best-trained foresters in the country can most easily improve. The Society has been holding weekly meetings for the reading and discussion of papers during the last couple of months, and at the end of the year the best of these will doubtless be published. Its short experience has already made it clear that lack of interest need not be feared from the members, and such being the case, its proceedings are bound in time to key up the tone of forest discussions and writings, and to do good in many ways. Now that we have forest schools and a large amount of practical work under way in this country, it is high time that there were an organization which existed not for agitation, but for the ends to which this society is devoted.

CORRESPONDENCE.

Dying Oaks in Southern Wisconsin.

TO THE EDITOR OF THE FORESTER: I think that Mr. James Jensen is entirely right in his diagnosis of the trouble about oaks in the neighborhood of Geneva Lake. I had some time ago come to a similar conclusion, although I had not thought of referring the change in the moisture relations to the series of dry seasons. The trouble is widespread throughout southern Wisconsin. On the railway line between Milwaukee and Madison, for instance, dead oak trees are a conspicuous feature of most woodlands. Here is an example of how apparently slight changes in moisture conditions may affect the growth of a body of trees. There is a grove of oaks about fifty years old on the edge of the steep clay bluffs in the Menomonnee valley, west of this city. Until five years ago it was in very thrifty condition, with the forest floor well shaded and covered with some shrubby underwood and dense tangles of golden rod and similar herbs—

the very best state of the ground in this vicinity. In 1896, a road was built up the bluff, immediately adjoining the grove, in such a way that the latter was left standing on a promontory about fifteen rods in width, with steep, naked clay banks on three sides of it. These banks are about forty feet high. From that time the trees began to suffer, and at least one-third of them are now dead or nearly so. I can hardly doubt that this is due to the rapid drying out of this clay promontory, to which sun and wind has now such free access.

The building of roads is by no means an uncommon source of danger to forest trees. Especially in the case of hemlock, in this state, the death of all trees for a rod or more on either side follows it almost invariably.

ERNEST BRUNCKEN.

MILWAUKEE, WIS., Mar. 28.

NEWS, NOTES, AND COMMENT.

**New York's
New Forest
Commission.**

The consolidation of the Forest, Fish and Game Commission and the Forest Preserve Board of New York State has been effected and a new Forest, Fish and Game Commission of three members has been appointed in their place. The members of this Commission are DeWitt C. Middleton, of Watertown, Charles E. Babcock, of Rochester, and Lieutenant-Governor Timothy L. Woodruff. Mr. Woodruff was on the Forest Preserve Board and has been named as president of the new Commission. Mr. Babcock was one of the most valuable members of the Forest Preserve Board. Neither he nor Mr. Woodruff receive any salary and their terms of office expire January 1, 1903. Mr. Middleton is the salaried member of the new Commission in whom its powers and duties are centered, and holds office for four years. The Commission is a strong one and with it in control of New York's forest work should be one by which much is accomplished.

**New Hamp-
shire Forestry
Association.**

The Society for the Protection of New Hampshire Forests has drawn up a constitution, elected its officers, and begun its work. Articles 2 and 3 of the Constitution read:

"The object of this association is to preserve the forests, protect the scenery, and promote the establishment of good roads in New Hampshire, and to cooperate in other measures of public improvement in the state."

"Any resident or native of New Hampshire, or any person having an interest directly or indirectly in the state is eligible to membership."

In order that the membership may be large the annual dues have been fixed at twenty-five cents, and there is to be no initiation fee. Would-be members may pay four years' dues at once by sending in

one dollar. By sending twenty-five one may become a life member. All contributions should be sent to Mr. Joseph T. Walker, Concord, New Hampshire, the secretary of the Society. The other officers of the Society are: President, Ex-governor Frank W. Rollins, Concord; Treasurer, George T. Cruft, Bethlehem; Members of the Executive Committee, the president, secretary, and treasurer, Albert E. Pillsbury, of Boston, and Nahum J. Bachelder, Andover; County vice presidents and vice-presidents at large.

To do its very important work effectively the society must be in a position to pay large bills for printing, postage, the expenses of meetings, traveling expenses, etc., and it is to be hoped that all who are in sympathy with its work will give twenty-five cents, and that all who can will give more.

**A New
Forest Law
in Colorado.**

Members of the Colorado Forestry Association have this year brought a bill into the state legislature which has passed the house and senate without amendment and will soon become law. The gist of a good part of the bill is found in the first section which provides that "No trees needed to conserve the snows, ice or water of any irrigation district shall be cut from any part of the public domain, except as hereinafter provided." The bill prescribes a procedure for notifying county commissioners, the State Board of Land Commissioners, and those living in the watershed from which trees are to be cut of the intention of cutting them, in order that there may be time and every opportunity for protests to be made and examined. This, too, is provided for. In addition to this, the act requires citizens of the State who wish to camp in a forest district outside their own county to take out a permit, and compels non-residents of a State who wish to camp within the State to ob-

tain the services, at their own cost, of a game or forest warden, who shall be held strictly responsible for fires. It also provides that game and forest wardens shall be charged with the enforcement of the act as it relates to forest fires, and "shall have full power to arrest all violators and to deliver them to the nearest constable or sheriff to be dealt with according to the law." There is further a clause compelling railways to keep their rights of way free from inflammable material, and to equip their locomotives with devices for reducing fire risks. The act provides for suing the railway in the name of the State for damages of which it may be the cause, not only to the trees themselves, but to those relying on them for conservation of snow and irrigation waters, and to the promoters of adjacent forest growth.

Tree Planting in the Sand Hill Regions.

The Division of Forestry has decided to make a thorough examination of tree growth in the State of Nebraska during the coming summer, with the object of finding out whether forest production on a large scale is possible in this region. Throughout the greater part of Nebraska there is but a sparse timber growth, while portions of the State are practically treeless. From the results of the proposed investigations the Division of Forestry hopes to devise means of improving and extending the present forest growth, and, in the case of the treeless regions, to formulate a plan of tree planting whereby the waste lands may be reclaimed. The best methods of tree culture will be considered and the climate, soil, and natural enemies of the trees in this region will be studied. The results obtained from this tour of investigation will be of value to several of the neighboring states, for in Kansas, South Dakota, and portions of eastern Colorado, and Wyoming much the same conditions exist.

The valley of the Platte River, from Plattsmouth to Kearney, in the eastern part of the State, and the entire western half of the State, will constitute the field of investigation. About May 1st, two represen-

tatives of the Division will begin work at Plattsmouth, and go up the river examining and classifying the growth of trees. Especial attention will be paid to the distribution of species, and to all efforts to cultivate considerable bodies of timber. In the investigation of tree planting experiments the failures, as well as the successes will be noted, for it is desirable to obtain all possible information on the subject. Kearney will probably be reached before July 1st. At this point, the party will be increased to six members and will be equipped with a complete camp outfit, and saddle horses. The following four months will be spent in work that will practically cover the western half of the State. The line of travel will be from Kearney to the western boundary of the State, along the Platte, thence northeast to Crawford, and then in a general southeasterly direction through the sand hills, and down the middle Loup River to Loup City. As the party will be mounted it can study a wide strip of territory on each side of the route. Nebraska is the meeting ground of the plains and mountain floras, and for this reason the party is likely to obtain much valuable and interesting information.

The Division of Forestry has received sufficient encouragement from work already done in Nebraska to warrant the thorough examination that is to be made this summer. The fact that many tree growers in the State are already realizing substantial profits from planted timber is noteworthy. A number of men, who have had wide experience in dealing with the problem of forestry in Nebraska, have written to the Division of Forestry, stating that there is no doubt in their minds of the possibility of increasing the present scant growth of trees, and agreeing that even the sandhills can be forested. Among those who have expressed such an opinion are Ex-Secretary of Agriculture, J. Sterling Morton, Prof. Charles E. Bessey, of the University of Nebraska; C. S. Harrison, President of the Nebraska Park and Forest Association, and E. F. Stephens.

The rapid spread of interest in forestry will soon bring landowners to realize that

timber may be considered as truly an agricultural crop as wheat or corn. With the Division of Forestry investigating the best methods of tree culture and offering its advice and assistance to landowners interested in tree planting, there is reason to believe that in the near future much headway will be made in bringing about a reasonable forest growth on lands now almost treeless.

The work outlined by the Division, looking to the improvement of Nebraska forests, should attract general attention, considering that throughout this region forest products are in constant demand, commanding high prices and presenting a profitable field for the investment of capital. Improved forest conditions in Nebraska would mean cheaper fuel, a beneficial influence on local climate and a consequent increase in the value of land.

**Lieut.-Gov.
Woodruff on
Adirondack
Forests.**

Lieut.-Governor T. L. Woodruff was not long ago requested to attend the meeting of the Brown's Tract Guides' Association

of the Adirondacks, and to address the members. In consequence of his inability to be present, the Lieutenant-Governor sent the association a letter, in the course of which he said:

"As you know, I have been for four years engaged as president of the Forest Preserve Board in the work of purchasing for the State lands in the Adirondacks and Catskills. For \$1,950,000 this board has acquired 400,000 acres of land in the Adirondacks alone, and recovered about 90,000 acres which had been lost to the State by previous improper cancellations of the State's title. The lands thus purchased and acquired by the re-instatement of the State's title, through the operation of the forest preserve board, are worth twice what they have cost the State. In 1883, when a law was enacted prohibiting the further sale of land owned by the State in the Adirondacks, the State possessed 700,000 acres. During the following 13 years these holdings were increased to 825,000 acres, until in 1896 a 75,000-

acre tract was purchased from W. Seward Webb, as the settlement in a suit brought by him against the State for damages incident to the damming of the Beaver river for reservoir purposes. Therefore, the State owned 900,000 acres in the North Woods when we took up this work under the provisions of the forest preserve board act in the spring of 1898. Since then this acreage has been increased just 50 per cent., and to-day the State is in undisputed possession of about one-half of the Adirondack Park, the park embracing practically all the forest lands in the Adirondack region.

"In my opinion, it is unfortunate that, owing to the constitutional prohibition of the cutting of timber on State land, the matured trees throughout this well-timbered forest territory cannot be marketed, instead of going to waste and retarding as they do, the younger growth. The soft merchantable timber, or evergreens, on the State lands, which will soon die of old age, could to-day be sold for a sum sufficient to furnish the State with means to acquire the title to all the lands owned in the Adirondacks by corporations and individuals for lumbering purposes, provided they were granted a proper and reasonable reservation as to the large timber on their property at the time of its purchase. Not only would this course result in the acquisition of the land not at present owned by the State, but it would furnish employment to a vast number of our people and supply to the 98 pulp and paper mills in this State raw material, which is decreasing in quantity at a rate which threatens the impairment of this great industry, in which the State of New York leads all the other States of the Union. And what is of greater importance to your association, this plan would prevent the further cutting of hard wood, which has now assumed large proportions in certain localities, for the manufacture of wood alcohol and cooperage stock, and which is subjecting large areas of the Adirondacks to the danger of being stripped as clean as a desert. Thus would the next generation find a forest preserved to them by us as grand and beautiful as the one which the genera-

tion preceding us enjoyed, but neglected to preserve for us, even when it could be purchased for one-tenth of its present value."

The Aim of the Forester.

"There seems still to linger among a large class of people the idea that forestry consists in preventing lumbermen from cutting trees. These good people forget that our civilization is largely built of wood, and that trees must be cut to furnish the necessary material. It would be possible, though in most cases foolish and undesirable, to set aside portions where, for some reason, the forest should be left undisturbed; in such cases of let-alone policy, no forestry, *i. e.*, application of knowledge and skill in reproducing forest crops and keeping up the forest production, is needed; nature and proper police forces will take care of such areas.

"The forester is a harvester as well as a grower of a crop; he preserves the forest as the human race and all life is preserved, by removal of the old, and reproduction. In this last activity only, or mainly, does he differ from lumbermen; namely, in that he is bound to reproduce, not necessarily the kind of crop that nature planted, but one that is economically most desirable. He may secure this reproduction either by gradually removing the old crop, relying on seeds falling from, and seedlings developing under the mother trees left on the area—natural regeneration—or else he may remove the old crop at once and replant the cut-over area—artificial reforestation—or he may combine the two methods in a variety of ways. Which method is preferable depends upon many considerations, but mainly on financial ones."—Dr. B. E. Fernow, Third Report of the Director of the New York State College of Forestry.

Effects of Fire in Southern California.

"A year ago last October a fire occurred in the mouth of the San Antonio Cañon, burning out the side cañon, called Stoddard's Cañon.

"A gentleman from North Ontario

took observations during the late storm of the water passing off from the main or San Antonio Cañon and that from Stoddard's Cañon; in fact, he measured it and found that the water running from Stoddard's Cañon was four or five times greater in quantity than the stream running out of the main cañon. The relations between these cañons in size and water shed is as twenty-nine is to two. You can thus see the effect in wastage of burning over a given mountain area. Furthermore, it was noted in Stoddard's Cañon, burned completely bare, the water flowing in a flood-like volume from that cañon ceased altogether immediately after the rain.

"I have been managing director for some four years in the Del Monte Irrigation Company, which supplies irrigating water to 2,100 acres of land. We have a system of wells extending over a distance of a mile, from which our water is obtained. These wells until five years ago were flowing artesian wells.

"I came into the office as director about the time the wells ceased to flow. We placed pumps upon the wells and the first year pumped them down to 16 feet below the surface; the second year to 30 feet; the third year to 45 feet, and this year we pumped to 60 feet. Gentlemen, I am not at all certain that we can successfully pump another season unless the rain conditions are much more favorable than in the past few years.

"I have said I doubted our ability at Claremont to pump much longer, but, gentlemen, we are all in the same boat. When we stop pumping the Santa Ana River will be very low indeed, and the wells which you are pumping for a part of your supply have the same ultimate source as our own. Something, in my judgment, has got to be done by us to make these conditions more favorable, or else the pursuit of horticulture in this valley will have to be abandoned. I am only telling you this after many years of close observation of this matter. I am trying to lay the truth before you; something must be done, and done at once. We have too long remained supine, action

must be had without delay—effective action—or our occupation will be gone.

"I am not a prophet of evil, but mean to be a prophet of hope. * * * It rests with you. These reservations are your property, and if you say so these things can be done, but you must say it, and mean it, and work for it."—Geo. J. Mitchell before the Farmers' Institute at Etiwanda, *California Cultivator*.

Forest Reserves and Game Preservation.

The possible relation of forest reserves to the preservation of the big game in the West has been discussed in a recent issue of *Forest and Stream*. A correspondent, writing from Wells, Wyo., refers to the fact that in the region of the Yellowstone Park the decrease in the elk beyond a certain point is due largely, as in other parts of the West, to settlement and stock grazing on their winter ranges. In regard to the remedy this correspondent, Mr. William Wells, writes:

"Now as regards using the forest reserves as game preserves. In the first place, the present Teton Forest Reserve, which lies south of and adjoining the Yellowstone Park Timber Reserve, should be extended eighteen miles east and forty-eight miles south, thus taking in the great bodies of timber on the Wind River, Gros Ventre and Hoback mountains. All the agricultural land of any value that would be inside of this reserve is already settled upon, and it should be provided that no vested rights held by settlers should be invaded. If this should be done, the enlarged reserve properly patrolled and the forest rangers, as at present, instructed to enforce the State game laws, the future of the game in northwestern Wyoming would be assured. Suitable regulations should govern the grazing of stock on the reserve, and only actual residents on the reserve should be allowed to graze stock thereon.

"It must be remembered that the altitude of northwestern Wyoming is such that hay is the only crop which can be raised with certainty. The ranchmen are dependent upon stock growing, and with-

out the use of the outside range the ranches are valueless, as enough stock cannot be kept on 330 acres the year round to support a family. The wild game can winter in much deeper snow than can cattle, and the proposed reserve contains winter range enough for all the game at present upon it, without encroaching on the range needed for what stock would belong to the ranchman upon the reserve. It is the tramp herds of stock belonging to men who own not a dollar's worth of real estate that are destroying the public range. The free range is no longer large enough to support all the stock upon it, and a distinction should be made in favor of the men who are improving ranches and building up the country."

Commenting on this editorially, *Forest and Stream* says: "Mr. Wells's letter refers to one district only, and it is not likely that identical conditions prevail near all, or even many, of the other forest reservations. The character of the country included in these reservations varies greatly, and rules suitable for one may not apply to all. One thing, however, is clear. In each reservation there should be a considerable area, where hunting should be absolutely prohibited, which should be an actual and absolute refuge for game, where it could never be disturbed. To the country which surrounds them, such refuges would be, in a less degree, what the Yellowstone Park is to the forest reserves which adjoin it; they would be game reservoirs, which would annually pour forth a surplus of wild animals to stock the surrounding territory.

"These forest reservations, if wisely and reasonably administered, would not only be attractive places of resort to people from all parts of the country, but would be for all time sources of considerable and growing revenue to the States within which they lie, and to the communities situated on their borders, and no class of people in the whole country are so much interested in having the reservations made the most of as those who dwell nearest to them. The difficulty of carrying through such a wholesome change of policy is to make the very people who are

to be most benefited comprehend the advantages that they will gain by a proper guardianship of the reservations as to timber and game.

"For the public at large does not usually take the trouble to think for itself. No better example of this has recently been seen than the hysterical talk and writing indulged in when the great forest reservations were established by President Cleveland. For a time the newspapers—and among them *Forest and Stream*—were full of moanings, howlings and denunciations from people who feared something

they knew not what. But the reservations were established, their purposes patiently explained and the fears of the timid set at rest; and now practically everybody in the whole country believes in forest preservation and the setting aside of forest reserves as large as practicable.

"Within comparatively few years we expect to see the forest reserves set aside as game refuges on some such plan as *Forest and Stream* has already outlined. Only by such action can our North American big game be preserved from extinction."

RECENT PUBLICATIONS.

The Distribution of Forest Trees in Iowa. Reprint from Report of Iowa Academy of Sciences, 1899. By B. Shimek.

Flora of Lyon Co. (Iowa). Reprint from the Report of the Iowa Geological Survey, 1899. By B. Shimek.

The first paper is a discussion of the causes affecting the distribution of natural timber and the formation of prairies in Iowa. Fires, excess of moisture, insufficient moisture, temperature, geological formations, and soils are mentioned as the agencies commonly cited as restricting the forests and causing the prairies. The writer asserts that these causes are inadequate to have produced the present conditions and that a hitherto little noticed agency, wind, is of great importance in this connection, affecting trees mechanically by breaking them, by stripping them or injuring foliage, by spreading fires, and, physiologically by checking the processes of respiration and assimilation. If this is true, the scantiest forest growth is to be expected in the most exposed situations, while the best growth will be confined to places protected from the wind. This the writer finds to be the case, regardless of the operation of other agencies, such as soil and temperature. He states that the distribution of the native forests of the State is in harmony with the character and direction of the prevailing winds, taken in conjunction with the topography and course of the river valleys.

The point that the wind strongly influences tree growth on the western prairies is well taken and applies over a wide stretch of territory, though it is by no means new. It has long been noticed by observing persons, both in connection with natural and planted timber in the West. It should always be considered in conjunction with other forest-restricting agencies, and the author properly names it as one of the

most important agencies concerned in checking tree growth.

The second paper is an annotated list of the native trees and shrubs, cultivated forest trees, native herbs, forage plants and weeds of the northwest county of the State. Forty species of native trees and shrubs are mentioned as occurring, though none are abundant. Of this list sixteen species are said to occur chiefly along the larger streams, seventeen along protected banks and lower slopes, and seven on the higher slopes and dry places.

Of the trees planted in groves the native species are claimed to be more hardy than those introduced, and the deciduous better adapted to the country than evergreens. The European larch is mentioned as the best introduced tree, while the white ash and black walnut rank as the hardiest and most valuable trees among the natives. Mr. Shimek states that both native and planted timber thrives best in places where it is protected from the wind.

W. L. H.

Some Diseases of New England Conifers. *A Preliminary Report.* By H. von Schrenk. Bulletin 25. U. S. Department of Agriculture. Division of Vegetable Physiology and Pathology. Pp. 56. Plates XV. Figs. 3.

It is gratifying that a trained cryptogamist has been able to turn his attention to a line of study showing the relationship of fungi to the destruction of important American timber trees. The attempt does not pretend to be more than a preliminary one; but the subject-matter brought together has very great interest. The technical portion of Dr. Schrenk's paper will be welcomed by students interested in the pathological effect of these fungi on wood structure, while the practical deductions to be made are of value to the forester and lumberman.

Although the various large fungi common to the United States are by no means unknown to systematic cryptogamists, at the same time practically nothing has been done thus far to determine their effects upon our timber trees.

Dr. Robert Hartig has devoted much study to fungi injurious to European forest trees, especially those of German forests. The results of Dr. Hartig's studies have been widely published, and in some cases valuable suggestions have been made to prevent the spread of these injuries. Respecting American coniferous timber trees which have been grown in Germany, and there subjected to the attack of injurious fungi, we have learned considerable that is suggestive in the study of American species of fungi injurious to these timber trees as grown in America.

An interesting and vital point in Dr. Schrenk's studies is, how far the fungi described are directly accountable for the death of timber trees. There is also the very important question of how far the combined attacks of certain boring beetles and fungi are responsible for the destruction of living trees. So far, Dr. Schrenk's investigations point out mainly that injurious fungi attack weakened or very old trees through some wound. This discovery is, however, not at all encouraging, since a very large percentage of some of our forest trees are in a dead or dying condition as the result of fire and other causes than the attacks of fungi or insects. Dr. Schrenk points out that this useful dead timber may be rapidly destroyed by fungi. He shows also that in nearly all cases the destruction is complete.

For the restricted area over which Dr. Schrenk's preliminary investigations extended he finds there are five principal species of injurious fungi, with several others making a possible eight altogether. While some of these species are more or less common on the broad leaved trees, his attention was directed mainly to the effect of these fungi on the principal coniferous timber trees of New England forests. These trees are the Red Spruce, White Spruce (probably also the Black Spruce, which Dr. Schrenk seems to have erroneously considered the same as the Red Spruce) Balsam Fir, Hemlock, Arborvitæ, White Pine, and Tamarack are the remaining trees subject to the attacks of these fungi. The author very carefully describes the character of each fungus in its relation to the above trees, giving excellent illustrations also of the pathological effects upon the wood structure.

Owing to the short time possible to give to this report, the author is compelled to admit that the amount of damage wrought by these fungi must as yet remain unknown. He believes, however, that the destruction of dead and decayed timber is annually so great that the loss warrants the hastening on the part of lumbermen of careful utilization of all dead standing timber. Dr. Schrenk is unable also to point out any remedial measures of importance. The one which he cites under *Polyporus*

schweinitzii as a common resort in Europe for checking the spread of the fungus is hardly practical or applicable, as he himself admits, to forests in this country.

With extended investigation it is to be hoped that the author may be able to suggest methods of preventing the spread of injurious fungi in American forests. In the meantime, the serious damage wrought by these fungi suggests very plainly that over ripe coniferous timber should be utilized before it is rendered useless through the attacks of fungi.

There are, as a matter of fact, not a few small areas of old pine timber in the Northeast and Allegheny Mountain forests which are rapidly deteriorating through these causes. The owners are entirely unaware of the insidious destruction going on while they patiently wait for expected rise in stumpage value.

As a remedial precaution it seems possible that during lumbering operations much can be done that will lessen the damage from destructive fungi. Lumbermen are, in a practical way, very familiar with diseased trees. They know them, as Dr. Schrenk remarks, as punky, conchy, etc., and leave them standing because they are unfit for lumber. It would seem wise that such trees should be destroyed along with waste tops and brush which improved methods of lumbering insist on.

G. B. S.

Report on the Measurement of the Volume of Streams and the Flow of Water in the State of New York. By Edward A. Bond, State Engineer and Surveyor. Pp. 127. Map 1. Figs. and Illustrations 65.

The State Engineer and Surveyor of New York has issued a notable pamphlet dealing with the flow of the streams of New York, mainly for the year 1900. This publication is of interest to foresters and engineers since it shows the behavior of the streams issuing from the mountain and forest-clad lands of the State. It gives the daily discharge at various points in cubic feet per second, these facts being graphically shown by small diagrams. The condition of the rivers is also illustrated by numerous photographs.

It is to be hoped that the State will continue the collection of facts of this kind, as upon these must rest the largest and best utilization of the water resources of the State, and also considerations as to the preservation of the forest and the extension of the protection of the headwaters of the streams. After such data have been acquired, extending through a series of years, it will be possible to discuss more intelligently the effect of forest upon river flow.

The report is not worthy as an illustration of prompt and business-like methods on the part of the State engineering office. The work was authorized by law, dated April 13, 1900, and through cooperation with the U. S. Geological Survey the measurements were continued through that year and the results published before the end of December, the data being brought up to the 30th of November. Such

prompt computation of results and publication is worthy of praise and emulation by others.

Sylviculture in Relation to Horticulture. By Dr. John Gifford, Cornell University, New Jersey Horticultural Society Report. Pp. 18.

Silviculture and horticulture in their relations to each other are much talked about and much misunderstood. A paper like this one is most welcome. Dr. Gifford has a good deal to say about the relations between silviculture and horticulture in warm countries, but the last part of his article is devoted especially to the value of silviculture to the farmers of New Jersey. The difficulty of an economical protection against fire is touched upon, and a number of suggestions are made with regard to it.

Compilation of Notes on the Most Important Timber Tree Species of the Philippine Islands. Prepared by Capt. G. P. Ahern, in charge of the Forestry Bureau at Manila. Pp. 103; colored plates XLV. Cloth \$2.00, gold; leather \$3.00, gold. Address Forestry Bureau, Manila, P. I.

This book is intended to make accessible to any one who may be interested in Philippine woods or the forests of the islands and their exploitation, whatever information of a practical sort is now in print. The following are the headings of the book's eight chapters:

1. Extract from Forestry Regulations, and list of tree species not at present on tariff list.
2. Notes on the Philippine forests and their exploitation.
3. Descriptive notes of fifty important tree species.
4. The Anay or White Ant.
5. Strength and weight of woods.
6. Uses of woods.
7. Gutta-percha.
8. Authorities cited.

Captain Ahern evidently thinks that the proper management and care of the Philippine forests is synonymous with their proper exploitation. At present, roads and all means of transportation are lacking, so that the forests are inaccessible for any purpose, and such are the methods of managing and cutting that the innumerable forest products are being wasted where they do not go to waste.

This book makes no pretense at being original in contents, or being more than a pamphlet of

reference got out to meet the demands of the present hour. Of its kind, however, it is first rate and will certainly be most useful.

Progress of Forest Management in the Adirondacks. Annual report of the Director of the New York State College of Forestry. By Dr. B. E. Fernow. Pp. 40.

This is an interesting report on the work which the Cornell Forest School has carried on in managing its 30,000-acre tract in the Adirondacks. Its author makes it the occasion for a consideration of what "an American system of forestry," often mentioned nowadays, may really be. Although readers who do not know about the different attempts at forest management which have been made in the Adirondacks will probably fail to get the meaning of many of the things which Dr. Fernow says, this is undoubtedly the most interesting part of the report. Dr. Fernow decides that "If silvicultural methods have been properly applied to renew the harvested forest in superior composition; if the old crop has been utilized to the fullest possible extent; and if this is done with due regard to economy, all has been done that can be done." This may be true and may work well on the Cornell tract, but it does not necessarily follow, as the author seems to hold that it does, that estimates of the future yield of wood per acre, are more misleading than useful.

PUBLICATIONS RECEIVED.

Prospectus of the Yale Summer School of Forestry at Milford, Penna. Yale University, New Haven, Conn.

A Course in Forestry at the New Hampshire College of Agriculture and Mechanic Arts. Durham, N. H.

A Disease of the Black Locust. Hermann von Schrenk. Printed separately from the Twelfth Annual Report of the Missouri Botanical Garden. Pp. 10. Plates III.

The Commercial Side of Governmental and Private Forestry. By C. A. Schenk, Biltmore, N. C. Pp. 8.

Carrying Capacities of Irrigation Canals. By Samuel Fortier. Bulletin No. 71. Experiment Station of the Utah Agricultural College.

First Annual Report of the Michigan Forestry Commission, for the year 1900.

(To be reviewed later.)

Bird-Lore for 1901

BIRD-LORE'S special aim during the coming year will be to assist teachers and students of birds by telling them just what to study and just what to teach at the proper season. It will, therefore, publish a series of articles on the birds of a number of localities, including the vicinity of Boston, New York, Philadelphia, Chicago and San Francisco. To these will be added 'Suggestions for the Months' Study' and 'Suggestions for the Months' Reading.' The whole thus forms a definite plan of study which, it is believed, will be of the utmost value to the instructor, to the independent observer, and to bird-clubs and natural history societies. In this connection much assistance will be rendered by BIRD-LORE'S *Advisory Council*, composed of over fifty prominent ornithologists, residing throughout the United States and Canada, who have consented to respond to requests for information and advice.

While a number of the more general articles for the year will bear on the months' subject for study, there will also be contributions of wide popular interest, among the more important of which may be mentioned an address on Audubon, by Dr. Elliott Coues; letters written by Audubon in 1827; John Burroughs' list of his rarer bird visitors; Frank M. Chapman's fully illustrated account of a bird-nesting expedition with this genial naturalist; Ernest Seton-Thompson's 'How to Know the Hawks and Owls' (illustrated); Tudor Jenks' 'From an Amateur's Point of View'; T. S. Palmer's 'Ostrich Farming in America' (illustrated); F. A. Lucas' 'Birds of Walrus Island,' with remarkable illustrations; H. W. Henshaw's 'Impressions of Hawaiian Birds'; C. Will Beebe's illustrated account of some of the birds under his charge at the New York Zoological Garden, and an important paper on 'Bird Protection in Great Britain,' by Montagu Sharpe, chairman of the English Society for the Protection of Birds.

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